Santa Clara Valley Water District
Water Use Efficiency Program

ANNUAL REPORT

Fiscal Year 2003-2004











Our Mission

The mission of the District is a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally sensitive manner.

Santa Clara Valley Water District

5750 Almaden Expressway
San Jose, CA 95118
(408) 265-2600
www.valleywater.org

Santa Clara Valley Water District Board of Directors



Rosemary Kamei
District 1

Joe Judge
District 2

Richard P. Santos
District 3

Larry Wilson
District 4

Gregory A. Zlotnick
District 5

Tony Estremera
At Large

Sig Sanchez
At Large

Front row, seated (from left to right): Sig Sanchez, Rosemary Kamei, Gregory Zlotnick. Back row, standing (from left to right): Joe Judge, Tony Estremera, Larry Wilson, Richard Santos.

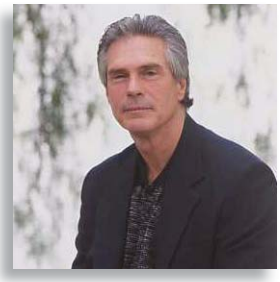


About the Santa Clara Valley Water District

The Santa Clara Valley Water District is the primary water resources agency for Santa Clara County, California. It acts not only as the county's water wholesaler, but also as its flood protection agency and is the steward for its streams and creeks, underground aquifers and District-built reservoirs.

As the county's water wholesaler, the Water District makes sure there is enough clean, safe water for homes, businesses and agriculture. As the agency responsible for local flood protection, the Water District works diligently to protect Santa Clara Valley residents and businesses from the devastating effects of flooding.

Our stream stewardship responsibilities include creek restoration and wildlife habitat projects, pollution prevention efforts and a commitment to natural flood protection.

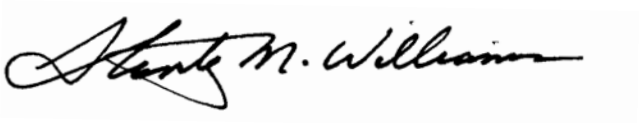


From the Office of the CEO

The Santa Clara Valley Water District has provided a safe, reliable and affordable water supply to Santa Clara County residents and businesses for 75 years. For much of this time, the District has been a leader in the state by emphasizing one of the best ways to ensure this safe, reliable and affordable supply: through water use efficiency. During Fiscal Year 2003-2004, the District's Water Use Efficiency Program and its partners helped the community save over 43,000 acre-feet of water—over 10 percent of Santa Clara County's current total annual water use—through water conservation and water recycling. And we don't plan to stop there. By the year 2020, we plan to have 20 percent of the county's total annual water supply provided by water conservation and recycling.

Fiscal Year 2003-2004 proved to be a successful year for the Water Use Efficiency Program in many other ways as well. New partnerships were formed and existing ones strengthened; innovative, new programs were tested and launched; and the District was recognized several times for excellence in promoting water use efficiency. In fact, the District was selected as a finalist for the Association of California Water Agency's 2004 Clair A. Hill Award for Excellence, and the District's water use efficiency exhibit at the 2003 Fall Home and Garden Show was the recipient of the American Horticultural Society's Environmental Award.

We look forward to the next 75 years of being the community leader in water use efficiency.



Stanley M. Williams
Chief Executive Officer
Santa Clara Valley Water District



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Water Use Efficiency Unit of the Santa Clara Valley Water District, managed by Hossein Ashktorab, comprises water conservation, water recycling and desalination.

Water Utility Enterprise

Walt Wadlow
Chief Operating Officer

Water Supply Management Division

Keith Whitman
Deputy Operating Officer

Melanie Richardson
Assistant Operating Officer

Water Use Efficiency Unit Staff

Hossein Ashktorab
Unit Manager

Shicha Chander
Assistant Engineer II

Jerry De La Piedra
Senior Water Conservation Specialist

Kevin Galvin
Water Conservation Specialist I

Pam John
Senior Civil Engineer

Jeannine Larabee
Water Conservation Specialist I

Karen Morvay
Water Conservation Specialist II

James O'Brien
Senior Civil Engineer

Robert Siegfried
Assistant Civil Engineer Agricultural

Toni Vye
Senior Office Specialist

Ray Wong
Associate Engineer (Civil)

Stanley Zhu
Associate Civil Engineer



Introduction

This third annual report, issued by the Santa Clara Valley Water District's Water Use Efficiency Unit (WUE), provides an overview of achievements in Fiscal Year 03-04, a look at current water use efficiency programs, including water conservation, water recycling and desalination. The report also looks at new and future projects and partnerships.

The Santa Clara Valley Water District (District) has been and continues to be a leader in water use efficiency, with programs that are innovative and comprehensive in scope. In FY 03-04, these water conservation and water recycling programs helped save the District a total of 43,280 acre-feet (1 acre-foot = 325,851 gallons) of water.

Several new programs and partnerships were created during FY 03-04, including a study to examine the feasibility of desalination for Santa Clara County. The Bay Area's four largest water agencies, East Bay Municipal Utility District, the San Francisco Public Utilities Commission, Contra Costa Water District and the Santa Clara Valley Water District, are jointly exploring the development of regional desalination facilities that could benefit 5.4 million Bay Area residents and businesses served by these agencies. The Bay Area Regional Desalination Project may consist of one or more desalination facilities, with an ultimate capacity of up to 80 million gallons per day.





Installation of evapotranspiration (ET) irrigation controller.

Several new programs commenced in FY 03-04. The Weather-Based Irrigation Controller Program was launched in early October, and provides historical and real time evapotranspiration (ET) controllers to residential and small commercial sites throughout Santa Clara County.

Another new program is the District's High Efficiency/Dual Flush Toilet Rebate Program. This innovative toilet rebate program provides a $125 rebate for replacing old, inefficient toilets with new, high-efficiency ones.

Two other new programs launched this fiscal year include the Commercial/ Industrial/Institutional Water Use Survey Program, which offered free water use evaluations and water efficiency recommendations to businesses in Santa Clara County, and the Water Softener Rebate Program, which offered a $150 rebate to residents who replaced their pre-1999 installed timer-based water softener with a new demand-initiated regeneration water softener.



In FY 03-04, the District launched a pilot water softener rebate program.

Finally, the District was recognized in FY 03-04 for several of its programs:

- The District's water use efficiency exhibit at the 2003 Fall Home and Garden Show (August 22-24) was the recipient of the American Horticultural Society's Environmental Award. The Environmental Award was presented to the exhibit which best demonstrated the bond between horticulture and the environment, as well as for inspiring the viewer to beautify their home and community through skillful design and appropriate plant material. Criteria for the award included design, aesthetics, use of plant material and environmental stewardship. More than 20,000 people attended this year's show.



Award received at the 2003 Fall Home and Garden Show.

- The Santa Clara Valley Water District was selected as a finalist for the 2004 Clair A. Hill Award for Excellence, presented by the Association of California Water Agencies (ACWA). The District was recognized during the ACWA Spring Conference in Monterey, May 5-7, 2004 for the Water Use Efficiency Unit's Agricultural Groundwater Stewardship (AGS) Program, which addresses the protection of groundwater quality in the Santa Clara Valley through a combination of agricultural irrigation system evaluations and fertilizer management assistance and is one of the most comprehensive agricultural groundwater protection programs in the state. The AGS program directly and flexibly addresses interrelated agricultural causes of aquifer degradation: water and fertilizer use efficiencies.



In 2003, the District was selected as a finalist for the ACWA Clair A. Hill Award for Excellence.



Participants check drip system distribution uniformity at the District's annual "fertigation" workshop, which is an agricultural technique of applying fertilizer through an irrigation system.

Water Use Efficiency Events for FY 03-04



The Water Use Efficiency Unit continued to provide education and outreach in FY 03-04, promoting District water use efficiency programs to residents and businesses at nearly thirty different events. These outreach events, seminars, and workshops are targeted at a wide variety of audiences. Many of these educational opportunities are co-sponsored and coordinated in cooperation with other agencies, such as cities, utilities, water retailers, and universities.



2003

Aug. 1-3	**Santa Clara County Fair** *Water Wise Gardening booth at event*
Aug. 22-24	**South Bay Fall Home and Garden Show** *Water Wise Gardening booth at event*
Aug. 27	**Fertigation Class** *Hands on field instruction for irrigators and growers*
Sept. 18	**NASA Ames Safety Fair Week**
Sept. 21	**Chinese Moon Festival**
Oct. 1	**Lockheed/Martin Environmental Fair**
Oct. 10-12	**San Francisco Restaurant Show**
Oct. 11	**Pumpkins in the Park** *Water Wise Gardening booth at event*
Oct. 15	**Proxim Corporation Health Fair 2003**
Oct. 28	**CUWCC Cooling Towers Workshop** *Event hosted by SCVWD*
Dec. 2	**Continuing Education Seminar** *In cooperation with the Santa Clara County Agricultural Commissioners Office*
Dec. 12	**South Bay Chrysanthemum Growers Association Annual Dinner** *In cooperation with the Santa Clara County Agricultural Commissioners Office*



2004

Feb. 21	**Sustainable Landscaping Seminar**
Feb. 28	**ET Controller Workshop**
Mar. 3	**Tri-County Apartment Association 2004 Expo** *Water Use Efficiency booth at event*
	SCVWD Water-Efficient Gardening Workshop Series:
Mar. 6	*Workshop: Selecting Plants for your Water-Wise Garden*
Mar. 13	*Workshop: Water-Efficient Irrigation Design*
Mar. 20	*Workshop: Water-Wise Garden Design*
Mar. 27	*Workshop: Gardening with Natives*
Mar. 16	**UCCE/NRCS Farm Quality Planning Short Course**
April 3	**10th Annual Master Gardener Spring Garden Market** *Water Wise Gardening booth at event*
April 18	**Going Native Garden Tour**
April 18	**SCVWD Day at San Jose Giants** *Water Wise Gardening booth at event*
April 22	**Earth Day at Intel** *Water Wise Gardening booth at event*
April 29	**Five County Greenhouse Workshop** *In cooperation with UCCE, San Benito County Water District*
May 21	**Kids Day America**
May 21	**Northern California Chapter of Water Reuse** *Event hosted by District at SCVWD headquarters*
June 8	**ET Controller Workshop**
June 12	**Executive Council for Homeowners (ECHO)**
	SCVWD irrigation seminars for landscape contractors:
June 16	*Irrigation Seminar in English*
June 17	*Irrigation Seminar in Spanish*



Water Conservation

OVERVIEW

The District has over a dozen specific conservation programs which use a mix of incentives and rebates, free device installation, one-on-one home visits, site surveys, and education outreach to reduce water consumption in homes, businesses and agriculture.

Besides meeting long-term water reliability goals, WUE programs help meet short-term demands placed on the water supply system during critical dry periods. They also help reduce the occurrence of demand reduction requirements made to water retailers. In addition, they reduce wastewater flows to Bay Area treatment plants, protecting the Bay's salt marsh habitat.

Last year, water savings attributed to all WUE conservation programs for residents, business, and agriculture reached 33,400 acre-feet, putting the District on-target to meet its current Integrated Water Resources Plan (IWRP) conservation goals. By 2020, the District plans to save more than 92,000 acre-feet (IWRP, 2003) of water per year through its current and future conservation programs. To assure that programs have the greatest impact at the lowest cost, the District applies for and receives grant funding, and partners with cities and other agencies when possible to share financial and administrative demands. The District also continually evaluates the performance of its programs to ensure that they are delivered in the most cost-effective manner possible.

WATER CONSERVATION in the home

The District continues to expand residential programs, as this sector remains the biggest water consumer at 52 percent of total county water consumption. This percentage is split fairly evenly between indoor and outdoor usages.

The District uses a multi-pronged strategy of incentives and rebates, one-on-one home visits with free installations of water-saving devices, workshops, and outreach at community events to promote residential water savings. Last year, the total savings attributable to all residential conservation programs reached 24,500 acre-feet.



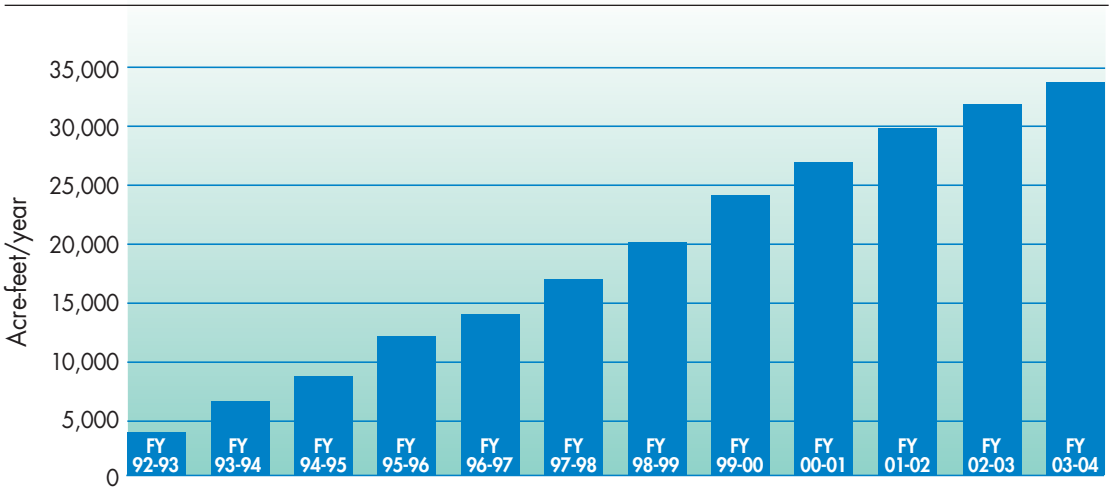
A District technician on a Water-Wise House Call checking a resident's water meter.



Water-Wise House Calls Program

The District has been providing the Water-Wise House Call Program at no cost to participants since 1998. The program is available for residents of single-family homes and owners/managers of apartments, condominiums, and mobile home complexes. During the survey, technicians check for leaks, measure flow rates, offer conservation information, and install free showerheads and aerators. Surveyors also test the customer's irrigation system for efficiency, calculate and program a personalized irrigation schedule, and provide landscaping tips.

Total water savings for WUE conservation programs



The District performed nearly 2,500 residential home surveys during FY 03-04.

The District continues to routinely inspect and change toilet flappers. These inspections are especially important since a California Urban Water Conservation Council study revealed that toilet leaks were the top reason for water waste in the home.



A Water-Wise House Call technician looks at an irrigation controller with a resident.

Low-flow Showerhead and Aerator Replacement Program

In FY 03-04, the District distributed 8,725 aerators and 4,830 low-flow showerheads. Because the saturation rate for these low-flow devices is so high, (due to plumbing codes, new construction and the District's successful distribution program), the WUE Unit is not marketing low-flow showerheads and aerators quite so aggressively at community outreach events. However, they were still installed during Water-Wise House Calls, and are still available by mail, on-line through the District's website, and through water retailers.

Despite the slow down in low-flow showerhead and aerator distribution, these devices accounted for approximately 8,180 acre-feet per year in water savings for FY 03-04.

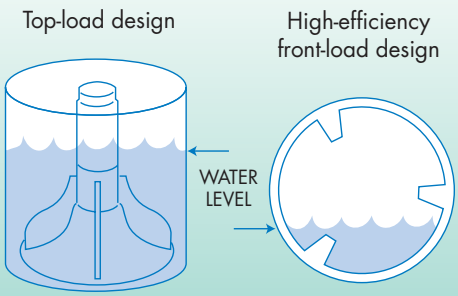
Residential Clothes Washer Rebate Program



The District continued to provide county-wide rebates to residential customers who replaced their old clothes washers with new, water-efficient clothes washers, which use about half the water and energy of the older machines. The District has been offering the rebate program since 1995.

In FY 01-02, the District received a CALFED matching grant for residential high-efficiency clothes washer rebates. This grant ended during the final quarter of FY 02-03, reducing the District's rebate to $50 for the final quarter. Nevertheless, nearly 8,000 rebates were given out during FY 03-04.

Comparison of Clothes Washer Designs



High-efficiency front-load machines wash the same amount of clothing while using less water and energy.

Water Use Efficiency

CONSERVATION TIMELINE

1987 (Drought Years)
- District installs CIMIS weather station in Santa Clara.
- District distributes 50,000 water conservation kits.

1991
- District conducts conservation media campaign
- District is one of first signatories to the voluntary Memorandum of Understanding with the California Urban Water Conservation Council, which instituted conservation Best Management Practices.

1992
- District introduces Residential Ultra-Low-Flush Toilet and Low-Flow Showerhead Replacement programs.

1993
- District begins offering residential water-efficient landscaping workshops.

1994
- CALFED Bay-Delta Program established to address environmental and water management issues of Bay-Delta system.
- CIMIS Hotline established at District.

1995
- District introduces Irrigation Technical Assistance Program and Residential Clothes Washer Rebate Program.

1996
- Integrated Water Resources Plan (IWRP) adopted by SCVWD Board with goals to increase county water conservation and recycling.

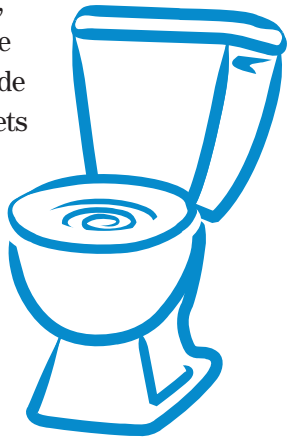
1997
- District installs its second CIMIS weather station in Morgan Hill.



Water Conservation Specialist Kevin Galvin stands with employees from a local women's shelter, the recipient of a new Energy Star washer and dryer from Flex Your Power and Maytag.

High Efficiency Toilet Program

The District's new innovative High Efficiency Toilet (HET) Program provides a $125 rebate to residents when they replace their old water-guzzling toilet with new HETs. This new generation of toilets uses at least 20% less water than the federal regulated 1.6 gallon per flush (gpf) toilets. HETs include two types of technologies: one gallon pressure assist, which utilizes a flush valve similar to commercial grade toilets; and dual flush toilets which have full and half-flush options. The District issued more than 32 high efficiency toilet rebates in FY 03-04.





Water conservation technician programs evapotranspiration (ET) irrigation controller.

Evapotranspiration (ET) Controller Pilot Program

The District's new Evapotranspiration (ET) Controller Pilot Program utilizes weather-based irrigation scheduling in managing landscape water use. This new generation of irrigation controllers utilizes data from several environmental factors, including temperature, relative humidity, wind speed, and solar radiation to calculate site specific irrigation schedules. These controllers modify their irrigation schedules on a daily basis to remain consistent with the landscape's irrigation requirements.

The District's Weather-Based Controller program installed 125 ET controllers in its initial year.

Pilot Water Softener Rebate Program

The District launched a Water Softener Rebate Program this year, with grant funding from a DWR Prop. 13 grant. A rebate of $150 was offered to residents who replaced their old, inefficient water softener with a newer, more efficient model. Instead of being timer-based, these newer models work on demand, saving water, energy and the amount of salt required.

Water Use Efficiency

CONSERVATION TIMELINE

1998

- District introduces Water-Wise House Calls Program and Mobile Lab Program.
- District begins offering annual irrigation efficiency workshops for growers.

2000

- District introduces Commercial Clothes Washer Rebate Program.

2001

- District Water Conservation and Recycling Units combine to form Water Use Efficiency Unit.
- District expands Water Efficient Technologies Program to entire county.

2002

- District introduces Pre-rinse Sprayer Program for restaurants.
- District employs a third, portable CIMIS weather station.
- Water Efficiency Baseline Study commences.

2003

- District receives ACWA Theodore Roosevelt Environment Award.
- $1.9 million in WUE grants received in FY 02-03.
- District begins CII Water Use Survey Program.

2004

- New programs introduced: High Efficiency Toilet Program, ET Controller Program and Water Softener Rebate Program.

Irrigation Technical Assistance Program

The District has been providing technical assistance to large landscape managers since 1995 through the Irrigation Technical Assistance Program (ITAP). Technicians check the irrigation system for deficiencies, determine an optimum water use budget, and develop an efficient watering schedule.

ITAP participants can potentially save up to 1,500 gallons per day per acre, representing a potential $1,000 per acre cost savings annually.

The District provided 80 sites with ITAP services in FY 03-04. Since the program's inception, over 600 parks, golf courses, large commercial sites, and large residential developments have received ITAP evaluations.



Irrigation system evaluation at Shoreline Amphitheater.

Water Efficient Technologies Program

The Water Efficient Technologies (WET) Program offers rebates between $400 and $50,000 to commercial, industrial, and institutional water customers for making process and equipment changes to reduce water use and wastewater flows. Beyond the initial rebate amount, participants continue to save year after year on water and sewer fees. Energy and chemical costs may also be reduced.

The WUE Unit administers the WET program in the cities of Gilroy, Los Altos, Los Altos Hills, Morgan Hill, Mountain View, Palo Alto, Stanford, San Martin and Sunnyvale and the cost of the program with the City of San Jose in the remaining Santa Clara County cities.

In FY 03-04, nine WET projects were completed throughout the county, resulting in a water savings of 49.4 million gallons per year and just over $124,000 in rebates issued.

Pre-Rinse Spray Valve Program

"Rinse and Save," a program designed to save restaurants water and money, began in FY 02-03, and continued into FY 03-04. The California Urban Water Conservation Council, with funding from the California Public Utilities Commission, the Santa Clara Valley Water District, and the City of San Jose, offered restaurants within the PG&E territory a free pre-rinse spray valve and installation. These high-efficiency spray valves save an average of 200 gallons of water per unit per day. Each one of the 1,070 valves that were installed through this program is expected to save more than 357,000 gallons over the next five years.

Commercial Ultra-Low Flush Toilet Retrofit Program

For FY 03-04, the District continued the Commercial Ultra-Low Flush Toilet (ULFT) Program. The program was altered slightly from the previous year, providing free ULFTs but asking businesses to do their own installation.

Another change was made in marketing efforts. This program utilized the data collected during the Rinse & Save Program (which installed free pre-rinse spray valves in restaurants) and the Commercial, Industrial, Institutional Water Survey Program. Both data sources provided valuable information about which businesses currently did not have ULFTs. This targeted marketing made it much easier for our staff to market the program to businesses such as restaurants, that have a high water use. A total of 274 ULFTs were installed in the Commercial, Industrial and Institutional sectors in FY 03-04, bringing the total water savings to approximately 3,700 acre-feet.



Commercial Clothes Washer Rebate Program

The Commercial Clothes Washer Rebate Program provides laundromats and apartment complexes in Santa Clara County rebates between $275 and $450, depending on location, for each purchased or leased commercial high-efficiency clothes washer. To help fund the program, the District established cost-sharing agreements with the cities of San Jose, Santa Clara and Palo Alto, the California Water Service Company, and Energy Solutions (through a grant from the California Public Utilities Commission).



In FY 03-04, the Commercial Clothes Washer Rebate Program provided 379 rebates, which represents approximately 194 acre-feet of water per year in savings.

Commercial, Industrial, Institutional Water Use Survey Program

The California Department of Water Resources granted the District $100,000 to offer commercial, industrial, and institutional water use surveys to businesses in Santa Clara County.

A water use efficiency expert was hired to conduct on-site water use surveys of businesses. Twenty-six sites were surveyed from July 2003 to February 2004, including ten commercial facilities, twelve industrial sites and four institutional locations. The final reports helped companies identify how to save water, energy and money.

The program succeeded in assisting companies in determining if any water use efficiency opportunities exist at their facility, and, if so, determining whether those needs could be met by any of the water use efficiency programs at the District.

WATER USE EFFICIENCY
in agriculture

The District's Water Use Efficiency Unit conducts winter and spring growers' meetings and provides a technical assistance program supported by financial incentives to assist growers with improving irrigation practices. District agriculture programs also support the Central Valley Project Improvement Act, an historic compromise between agricultural, urban and environmental interests on the allocation of water resources.

Integrated Irrigation and Nutrient Management Program

The District began the Mobile Lab Program in 1998 to help growers assess the efficiency of their irrigation systems. The program also is an element of compliance with the Central Valley Project Improvement Act. The Mobile Lab program has provided 136 on-site irrigation system evaluations to 61 growers since its inception. This represents a total of 2,973 acres. Potential annual water savings of 2,511 acre-feet have been identified.

Financial incentives for program participation are provided by discounts of the groundwater withdrawal fees. Mobile Lab provides free on-site pump and irrigation system evaluations to farmers and greenhouse operators. Technicians measure pumping plant efficiency and the distribution uniformity of irrigation systems.

At the end of the 03-04 fiscal year, the program combined with the Infield Nutrient Assessment Assistance Program in recognition of the close relationship between fertilizer use efficiency and irrigation management. When the Mobile Lab became one component of the integrated Irrigation and Fertilizer Management Program, it increased the evaluations carried out in support of fertilizer use efficiency consultations.



Field meeting on irrigation uniformity.



Pump efficiency testing.



Field of irrigated marigolds, east of Morgan Hill.

Correspondingly, the fertilizer management component of the integrated program became more active in advising on irrigation scheduling.

Growers increase the efficiency of their water use through improvements in irrigation scheduling, and are then able to increase the efficiency of plant fertilizer uptake. This reduces the amount of leaching of fertilizer-derived nitrogen to the groundwater. A long-range goal of the program is to promote the efficient use of recycled water for agricultural irrigation.

California Irrigation Management Information System (CIMIS)

This valuable free service provides daily reference crop evapotranspiration data to growers and landscape irrigators to use for scheduling.

Reference crop evapotranspiration is the water use of a standardized (green grass) crop. The evapotranspiration of all other crops can be mathematically related to reference crop evapotranspiration. The District owns and maintains two CIMIS weather stations in Santa Clara County. One is active at Live Oak High School in Morgan Hill (since 1997), and one was temporarily decommissioned in November 2002, pending relocation. The latter station had been active since 1987 at the former University of California field station in Santa Clara. The weather stations measure sunlight intensity, humidity, wind and temperature hourly to estimate reference evapotranspiration.

The District's CIMIS weather stations are part of a statewide network of stations from which the California Department of Water Resources' (DWR) central computer downloads data nightly. Growers and landscape irrigators can access current irrigation scheduling information around the clock by visiting the District web site at www.valleywater.org.

The District also participates in gathering weather data from so-called "non-ideal" sites. These are sites throughout the county (and the state) which do not meet the specifications for a standard CIMIS station. Non-ideal sites are correlated mathematically to their nearest CIMIS site, and this relationship provides a means of making evapotranspiration data site specific. This long-range project will give landscape managers in local microclimates more accurate data for their irrigation decisions.



CIMIS weather stations provide growers with information to make efficient water scheduling decisions.

Water Conservation Education and Outreach



The key to any program's success is a good education and outreach component. To this end, the District has worked hard to develop effective and informative classes and materials.

Water Use Efficiency Nursery Program

For the last six years, the District has distributed water conservation information through display racks located at county nursery and garden stores. These display racks contain literature pertaining to water-wise gardening, efficient lawn watering, drought resistant plants, drip irrigation and District programs. In FY 03-04, 20 nurseries participated in the program throughout the District's service area.

Water-Efficient Landscaping Workshops for Homeowners

The District held its 12th annual Water Efficient Landscaping Workshop series in March over four weekends. The topics were: Selecting Plants for your Water-Wise Garden, Water Efficient Irrigation Design, Water-Wise Garden Design, and Gardening with Natives. The workshops are presented by landscape and irrigation experts each spring to provide practical advice on water-saving gardening. The workshops were very popular, with a total of 187 people attending the series of workshops.



Water-Wise gardening workshop.

Community Events

The District promoted water use efficiency at numerous community events in FY 03-04, including the 2003 Fall Home and Garden Show, Pumpkins in the Park, the Tri-County Apartment Association Expo, various community Earth Day events, Water Conservation Day at the San Jose Giants, irrigation seminars for landscape professionals, landscaping workshops for homeowners, and many others. These events give the WUE Unit an opportunity to talk to the public directly, and educate them about water use efficiency with hands-on displays, educational handouts and free water-efficient device distribution.

Fall Home and Garden Show

The District's water use efficiency exhibit at the 2003 Fall Home and Garden Show (August 22-24) was the recipient the American Horticultural Society's Environmental Award. The Environmental Award was presented to the exhibit which best demonstrated the bond between horticulture and the environment, as well as inspiring the viewers to beautify their homes and community through skillful design and appropriate plant material. Criteria for the award included design, aesthetics, use of plant material, and environmental stewardship. More than 20,000 people attended this year's show.



WATER CONSERVATION in business

The Water Use Efficiency Unit combines education, technical assistance and financial incentives to encourage commercial, industrial and institutional water users to reduce water consumption. Conservation programs help businesses save on water, energy and sewage costs. They also reduce wastewater flows to Bay Area treatment plants, protecting the bay's salt marsh habitats.

Annual water savings attributable to business conservation programs reached 7,968 acre-feet last year. Whenever possible, the District partners with other agencies and local cities to reduce administrative overhead and enhance the efficiency of programs.

Landscape and Agricultural Area Measurement and Water Use Budgets Study (LAMS)

PHASE 1

In 2002, the District used multi-spectral images to identify landscape and agricultural areas by parcel for over 900 square miles in Santa Clara County. These images were then used to categorize types of surfaces (such as areas of turfgrass, trees, landscaping, water features, bare ground, hardscape, etc.) for each parcel. This information will be used to calculate an optimal water budget for sites around the county. To date, this is the largest mapping project of its kind to have been done in the State.



Irrigation system evaluation at a golf course in Morgan Hill.

PHASE 2

Concurrently, the District developed web-based software that allows county water users to receive a site-specific water budget on-line by entering their contact information, meter readings, and other data. (The landscaped areas used to calculate the budget are provided by LAMS Phase I.) This countywide water budget database allows on-line users to compare their actual water usage with recommended amounts for their specific area.

To provide even greater benefits from the study, the District recently decided to expand the project by creating a statewide, web-based resource. The District, in partnership with Cal-Poly's Irrigation Training and Research Center, will develop software to include water budgeting and irrigation scheduling throughout the state. On-line users will be given a schedule—the optimum days and minutes of watering time per week—for their specific landscape, as well as irrigation guidelines and other vital information. The project is scheduled for completion by December 2004.

Summer Water Conservation Campaign

For the last several years, the WUE Unit has been partnering with the Districts's Community Relations Unit to develop an annual Summer Water Conservation Campaign. In the summer of 2003, the District conducted a water conservation campaign that included television, radio and newspaper ads. The focus of the campaign was exterior water savings, as landscape irrigation is one of the largest categories of residential water use.

As part of the campaign, the television show, *Evening Magazine*, featured the District's Water-Wise House Calls Program. WUE Unit staff were interviewed and taped while performing a House Call for a lucky Sunnyvale resident (chosen through a random drawing). The District also partnered with Summerwinds Nursery to promote the Water-Wise House Calls Program, with a drawing for free water-wise plants from the nursery and an opportunity to sign up for a House Call. In the fall, the District promotes a "Fall Back" campaign, reminding residents to adjust their watering schedules for the winter.



A Water-Wise House Call in progress.

May Water Awareness Campaign

The WUE Unit assisted the Community Relations Unit in developing a May Water Awareness Campaign, consisting of television, transit, radio and print advertising, using material from the State of California's Water Awareness Month campaign. The campaign's main goal was to increase community perception that it is important not to waste water—even when we're not in a drought—and to encourage community members to adopt water-efficient behaviors and implement water-saving technologies to help ensure future water supplies are adequate.

Going Native Garden Tour

The District co-sponsored Going Native Garden Tour 2004 took place on Sunday, April 18th. The tour was a great success with over 1,700 pre-registered participants visiting 32 native gardens at private residences throughout Santa Clara County.



The goal of the tour is to provide examples of residential gardens that are water-wise, low maintenance, and bird and butterfly friendly for the public to view. A variety of gardens landscaped with native plants covering small to large lots and ranging from newly planted gardens to well established ones were open to the public.

Seminars for Agriculture Professionals

Since 1998, the District has been presenting two workshops annually for growers—one in April and one in December—on topics relating to water and fertilizer use efficiency, District programs, farm safety and legal compliance. All workshops were presented with real-time Spanish translation.



Cucumber fields growing in Gilroy.

ANNUAL WINTER GROWERS MEETINGS

The District co-sponsored an Annual Winter Growers Meeting in December 2003 in South County which covered topics such as irrigation scheduling with CIMIS and tensiometers, and preventing run-off and groundwater contamination.

GREENHOUSE PRODUCTION WORKSHOP FOR THE ENVIRONMENTAL HORTICULTURAL INDUSTRY

The 2004 Greenhouse Production Workshop for the Environmental Horticultural Industry took place on April 29 in San Martin. This workshop was presented by the District and the UC Cooperative Extension Small Farm Program, along with the Western Farm Service, Santa Clara County Farm Bureau, San Benito County Water District, and the Pajaro Valley Water Management Agency.



Setting an ET irrigation controller.

ET Irrigation Controller Workshops

On January17 and February 28, 2004, the District held two workshops for the ET Irrigation Controller Pilot Program. This program, aimed at residents, is one of the first in the state to incorporate self-installation for residents. The workshops were taught by industry professionals, including representatives from ET Controller companies/manufacturers.

Landscape Irrigation Workshops for Professionals

The District has earned a reputation for offering practical, hands-on workshops that increase irrigation efficiency, conserve water and cut overhead. The annual seminars have waiting lists each year and consistently receive high marks on attendee evaluations.

The District conducts a special one-day water conservation workshop each year for landscape contractors; topics change annually as irrigation issues are identified in the field. In FY 03-04, the workshop covered basic hydraulics of an irrigation system, how to increase distribution uniformity, and common mechanical and electrical problems. The District offers the contractor workshops in both English and Spanish.

Cooling Tower Workshop

The California Urban Water Conservation Council (CUWCC) sponsored a workshop on October 28, 2003, "Water Efficiency For Cooling Towers" which the District hosted. This workshop, attended by water use efficiency professionals from Northern California, explored the mechanics of cooling tower technology and its relation to water use efficiency.



Cooling Tower Workshop in October, 2003.

Publications



GardenSoft CD-ROM Software

The District is working with the GardenSoft Company to provide a water-wise gardening CD-ROM tailored to the needs of the District for targeted distribution through workshops or other outreach programs, such as the Water-Wise House Calls Program. The CD-ROM will include a plant database, specifically designed for Santa Clara County, linked to digital photos of local water-efficient gardens. The software is scheduled for completion in FY 04-05.

Water Conservation Cost-Sharing Agreements and Grants

Water use efficiency is a community-wide effort, and it will take the cooperation of many agencies and organizations to meet future water supply goals. The District maintains cost-sharing agreements with many area cities and utilities to provide water use efficiency programs for residential and commercial water customers.

The WUE Unit administered over $559,567 in Cost-Sharing Agreements in FY 03-04. Cost-Sharing Agreements that were active in FY 03-04 included:

- **City of Palo Alto:** Cost-Sharing Agreement for a variety of water conservation programs, continued from FY 02-03 . . . . . .$106,480
- **City of Santa Clara:** Cost-Sharing Agreement for commercial high-efficiency clothes washer rebates $12,500
- **City of San Jose:** Cost-Sharing Agreement for a variety of water conservation programs $436,837
- **California Water Service Co.:** Continued from FY 02-03, for commercial high-efficiency clothes washers $3,750

The District also relies on grants from state and federal agencies to help fund program expansion and vital research. The WUE Unit participated in and finalized many different grant projects this year.



These grant projects include:

- **Pre-Rinse Sprayers:** The CUWCC's state-wide Rinse & Save Program continued into FY 03-04, ending in December 2003, after reaching the goal in the District's territory of 1,070 sprayers installed. The CUWCC received funding again from the California PUC to fund this program in FY 04-05. A DWR Prop. 13 regional grant for sprayer installation will also be available in FY 04-05.

- **ET Controllers:** This regional DWR Prop. 13 grant for funding weather-based irrigation controller retrofits will begin in FY 04-05.

- **Residential Clothes Washer Rebate Program:** A regional DWR Prop. 13 grant-funded program will begin in FY 04-05.

- **Irrigation System Hardware Upgrades:** This DWR Prop. 13 grant funded program will begin in FY 04-05.

- **Commercial Clothes Washers Rebate Program:** The CPUC funded this regional grant program, administered by Energy Solutions, to help fund high-efficiency clothes washer rebates. This program will continue through FY 04-05.



- **Innovative High-Efficiency Commercial Equipment Retrofits Program:** This program, funded by a DWR Prop. 13 grant, is designated to help fund financial incentives to replace commercial equipment with water-efficient models. This program will start in FY 04-05.

- **CII Water Use Surveys:** $100,000 grant from DWR Prop. 13, continued from FY 02-03.

- **Dedicated Landscape Meter Program:** $100,000 grant from DWR Prop. 13 funds retrofitting of mixed use meters with dedicated landscape meters.

Studies and Research

The District is continually conducting research, on its own and in collaboration with other agencies, to increase water savings and cost-effectiveness in its water conservation programs. At the same time, the District's recycling research is exploring new uses for recycled water, while helping to ensure that groundwater and the environment are protected. Data from the studies and research listed below will be vital in creating an effective, long-range water management strategy for Santa Clara County.

The District is striving to gain reliable information on how and why conservation programs work most efficiently. Ongoing research helps us evaluate the cost-effectiveness of our programs as well as test new programs and water-saving devices as they become available.

How do the attitudes and practices of residential, business, and agricultural customers affect their water use? Which programs and users have the greatest water savings potential? How can we use the latest technology to give customers the water conservation tools they need? These are just a few of the important issues being explored in the following studies.

Water Use Efficiency Baseline Studies:
Phase I: Residential
Phase II: Commercial, Industrial and Institutional

The Water Use Efficiency Baseline Studies are designed to give the District a better understanding of its customers' attitudes and practices regarding water conservation. The studies' results will help the District establish baselines from which future water savings can be measured, and determine the penetration of water-using hardware and appliances within the District's water service area.

These comprehensive studies will provide the specific data needed to develop the Water Use Efficiency Master Plan and streamline the District's water use efficiency programs for effective long-term water conservation. The project is necessary to determine specifically where the District has been successful in implementing conservation measures over the past decade, areas that need improvement or emphasis, and how best to continue the program in the future.

In FY 02-03 the District initiated the Residential Water Use Conservation Baseline Study as a Phase I project. The final report will be available in 2004.

At the end of FY 02-03, the District initiated Phase 2: the Water Use and Conservation Baseline Study for the commercial, industrial and institutional sectors. This study will be complete in fall of 2004.



Irrigation Submeter Study

In FY 00-01, the District provided submeters to three large landscape property owners—two homeowners associations and a commercial business park—which allowed them to monitor water used for irrigation. The District will continue to collect data for five years, and then analyze them for water savings to determine whether the program merits expansion.

Future Projects: Water Conservation

Dedicated Landscape Meter Program
The District has been awarded $100,000 for a Proposition 13 Urban Water Conservation Program Grant from the California Department of Water Resources to be used for the installation of dedicated landscape meters throughout the county. This project involves installation of dedicated meters at sites with high landscape water savings potential that currently have mixed-use meters. Two retail agencies in the SCVWD service area—Palo Alto and Mountain View—will pay for 10 sites within each agency's service area to install dedicated meters. The outreach program will target an additional 180 sites with promising water savings potentials where the customer will pay for meter installation. This program is scheduled to begin in FY 04-05.



Irrigation Retrofit Program
This project, funded by a $100,000 Proposition 13 grant is targeted at installing upgraded irrigation hardware for sites previously identified as having high, unrealized conservation potential by the District's Irrigation Technical Assistance Program (ITAP). By building on the customer information accrued through the ITAP program in the last three years, this program aims at difficult-to-attain but cost-effective landscape conservation on sites with greater than one acre of irrigated landscape. These hardware installations can be expected to produce water savings lasting longer than the savings that can be attained through behavior change alone. This project is expected to begin in FY 04-05.



Innovative Commercial, Industrial and Institutional Retrofits Program
The District received a $496,000 California Department of Water Resources Proposition 13 Urban Water Conservation grant to fund an Innovative High-Efficiency Commercial Equipment Retrofits Program for Santa Clara County, including high-efficiency x-ray equipment for the health care industry, dry vacuums for dental offices, and high-efficiency plumbing fixtures in commercial establishments. This program is expected to commence in FY 04-05.

Residential Clothes Washers Rebate Program

In July, 2004, the District, in partnership with seven other Bay Area water agencies, will unveil a new Clothes Washer Rebate Program, funded in part with a grant from the California Department of Water Resources. The District's portion of this grant is $618,750. This new program will offer a tiered rebate; that is, the more water-efficient the clothes washer, the higher the rebate amount. For Level 1 clothes washers, the rebate will be $100; for Level 2 clothes washers (more water-efficient than Level 1), the rebate will be $150. It is hoped that this additional incentive will encourage residents to purchase clothes washers that are as water-efficient as possible.

Commercial, Industrial, Institutional Water Use Survey Program

Because of the success of the previous CII Water Use Survey Program and to assist the District in meeting its CII water conservation goals, the Water Use Efficiency Unit will continue its CII Water Use Survey Program in FY 04-05. The FY 03-04 program was a smaller scale pilot CII Water Use Survey Program which successfully surveyed 26 facilities and identified a water savings potential of over 306 million gallons annually. This follow-up program will be structured similarly to the last one, with a goal of identifying even more potential water savings in the CII sectors.

Pre-Rinse Sprayer Programs

There are two Pre-Rinse Sprayer Programs that will start up in FY 04-05. One is a continuation of the previous program, Rinse & Save. The California Urban Water Conservation Council (CUWCC), through a grant from the California Public Utility Commission (CPUC), is administering their second statewide program to install pre-rinse spray valves in restaurants and commercial kitchens throughout California. The other Pre-Rinse Sprayer Program is administered through the East Bay Municipal Utility District, with a grant from a California Department of Water Resources. This program will also start in FY 04-05.



New high efficiency spray valve.



Installation of a new high efficiency spray valve under the Rinse & Save program.



Water Recycling and Desalination

OVERVIEW

Along with water conservation, water recycling and desalination are identified in the District's 2003 update to the Integrated Water Resources Planning (2003 IWRP) document as key components in meeting future dry year shortfalls. Recycled water and desalination are all-weather resources.

The District Board's Policies target recycled water use as 5 percent of total county water use by 2010, and 10 percent of total water use by 2020. These targets are reviewed annually by the Board. In fiscal year 2003-2004, recycled water use in the county is on target to meet the 2010 board policy target. In addition, recycled water use is being expanded in accordance with another Board Policy that calls for groundwater quality to be aggressively protected from contamination or threat of contamination.

The 2003 IWRP has the following recommendations for water recycling and desalination:

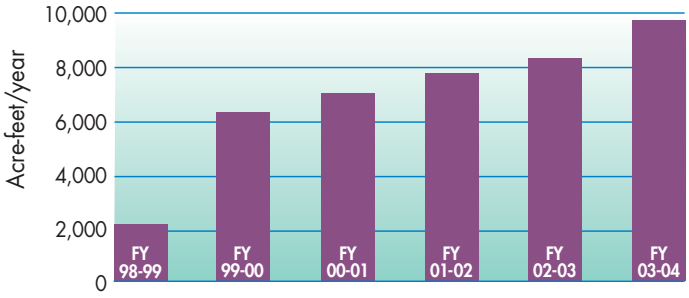
- "Encourage investments in New Local Water Sources—the District should continue to explore local options, such as expanded conservation, groundwater recharge, water recycling, desalination, and local storage to promote a greater variety of water sources."

- "Resolve water quality and market issues related to recycled water to evaluate potential use in the future."

- "Further study of advanced treatment of recycled water, engaging the public to avoid hurdles in recycled water perception and acceptance, seeking funding for advanced treatment projects and other recycled water projects. Taking these steps now will prove valuable if the District contemplates expanding recycled water over unconfined areas as well as indirect potable reuse in the future."

- "Explore the feasibility of desalination through studies to confirm potential quantities, public acceptance and costs." The 2003 IWRP recommends feasibility study work on both brackish desalination and seawater/bay desalination.

Total volume of recycled water use in Santa Clara County



All projects and programs conducted are in accordance with both the District Board policies as well as 2003 IWRP recommendations.

By laying the groundwork for new programs and studying recycled water uses and issues, the District will be ready to create partnerships and systematically expand countywide water recycling. Expansion of recycled water is critical during drought years when demand for recycled water is likely to increase. Using recycled water for irrigation and other uses makes potable, surface, and groundwater available for drinking purposes. Using more recycled water also protects the bay's salt marsh habitat by reducing freshwater effluent released from wastewater treatment facilities into the San Francisco Bay.

The District's approach to recycled water expansion is to develop partnerships



Educational tour of 5-mgd brackish water facility (full-scale) at Alameda County Water District.



Recycled water used for irrigation and water features at a local golf course in Santa Clara County.

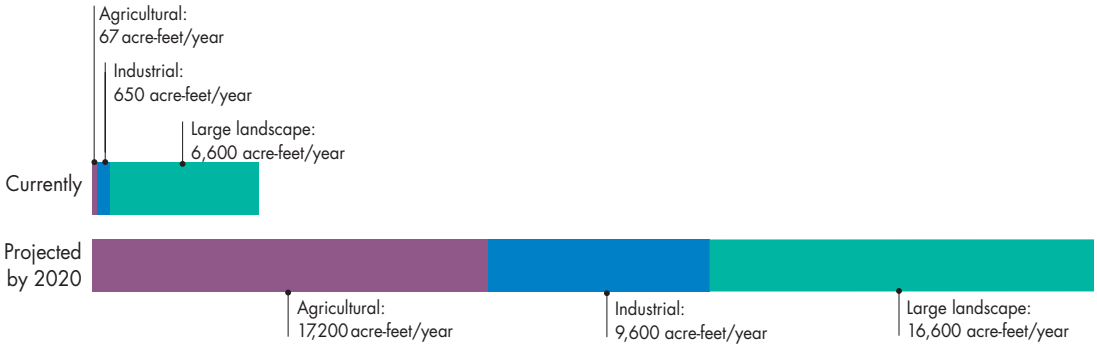
with the cities and publicly-owned agencies that produce and/or distribute recycled water.

The District has entered into recycling partnerships with three of the four recycled water producers in Santa Clara County: the South Bay Water Recycling Program (SBWRP) operating out of the San Jose/ Santa Clara Water Pollution Control Plant, the Sunnyvale Water Pollution Control Plant (Sunnyvale WPCP) and the South County Regional Wastewater Authority (SCRWA) in Gilroy. The District is pursuing a greater involvement with recycling programs for one remaining producer, the Palo Alto Regional Water Quality Control Plant (Palo Alto RWQCP).

Countywide total recycled water use (acre-feet/year)

Fiscal Year	South Bay Water Recycling Program	Sunnyvale Water Pollution Control Plant	South County Regional Wastewater Authority	Palo Alto Regional Water Quality Control Plant	Total recycled water used in county	% of total water supply
98-99	2,357	—	—	—	2,357	0.42%
99-00	5,002	439	896	63	6,401	0.64%
00-01	5,409	944	708	63	7,124	1.64%
01-02	6,037	1,210	487	66	7,800	1.73%
02-03	6,177	1,602	536	53	8,368	2.08%
03-04	7,246	1,816	619	200	9,881	2.60%

Recycled water use: current and projected



SOUTH BAY Water Recycling Program



Recycled water staff hearing about the operations at the San Jose/Santa Clara Wastewater Treatment Plant.

The South Bay Water Recycling Program (SBWRP) produces the majority of the recycled water delivered within Santa Clara County. In FY 03-04, the South Bay Water Recycling Program produced 7,246 of the total 9,880 acre-feet of recycled water used in the county.

The SBWRP was created to reduce the environmental impact of freshwater effluent discharge into the salt marshes of the south end of San Francisco Bay, and to help protect two endangered species: the California clapper rail and the salt marsh harvest mouse. The state requires that the San Jose/Santa Clara Water Pollution Control Plant keep summer wastewater flows below 120 million gallons per day.



California clapper rail

The District has been working with the City of San Jose on its recycled water program since 1994, providing financial and technical support for system expansion, and acting as a liaison with water retailers. The District also subsidizes the SBWRP at the current rate of $115 per acre foot of recycled water produced and utilized for non-potable applications to offset potable water use in the county. The District has been providing a financial incentive since 1995. The partnership between the District and the City of San Jose provides for the distribution of recycled water within the cities of San Jose, Santa Clara and Milpitas.

In January 2002, the San Jose City Council and District Board of Directors agreed to develop an institutional framework for the long-term ownership, operation, maintenance, and future expansion of South Bay Water Recycling that most effectively meets the needs of the community. This collaborative effort defines the relationship between the District and the SBWRP, and helps balance the water supply and wastewater discharge needs of the South Bay community.

South Bay Water Recycling Program Capital Projects (SBWRP)

SBWRP Phase I

Phase I of SBWRP construction, completed in 1999 at a cost of $140 million, consists of nearly 60 miles of pipeline, four pump stations and a reservoir. The system is capable of delivering 21 million gallons per day (MGD) and so far has had deliveries up

to 10 MGD on hot summer days. It serves over 380 customers, mainly for landscape irrigation at parks, schools and golf courses. Recycled water is also used in some local industrial cooling towers.

SBWRP Phase II

San Jose approved an $82.5 million Phase 2 expansion of the SBWRP in June 2001. The expansion includes additional pipeline extensions into Santa Clara and Milpitas, construction of the Silver Creek Pipeline into Coyote Valley in south San Jose and additional reservoirs and operational improvements to several pump stations to increase the system's reliability.

Silver Creek Pipeline Extension

As part of the agreement with the SBWRP, the District will share 25%, or approximately $6.8 million, of the total cost of the Silver Creek Pipeline extension. This pipeline will deliver recycled water to the Metcalf Energy Center, a new Calpine power plant being built in the north end of Coyote Valley. The power plant is expected to use up to 4,000 acre-feet of recycled water per year. Pipeline capacity that exceeds the needs of the power plant will be available to the District. The pipeline's construction was completed in the summer of 2004. Metcalf Energy Center's construction will be completed in spring 2005. The District is exploring the feasibility of using advanced treated recycled water in the future to make regional water more suitable for new markets. The Coyote sub-basin is an unconfined aquifer and the District is evaluating the appropriate quality of recycled water needed to avoid exposing this unconfined aquifer to any threat.

Construction of the Silver Creek Pipeline extension was completed in the summer of 2004.

Water Use Efficiency

RECYCLING TIMELINE

1975
- District conducts water recycling feasibility study with the City of Palo Alto.

1977
- District and City of Gilroy build recycled water system.

1994
- District partners with San Jose on the planning of South Bay Water Recycling Program (SBWRP).

1995
- District agrees to reimburse the City of Santa Clara for recycled water delivered.

1996
- Integrated Water Resources Plan adopted by Board with goals to increase county water recycling and conservation.

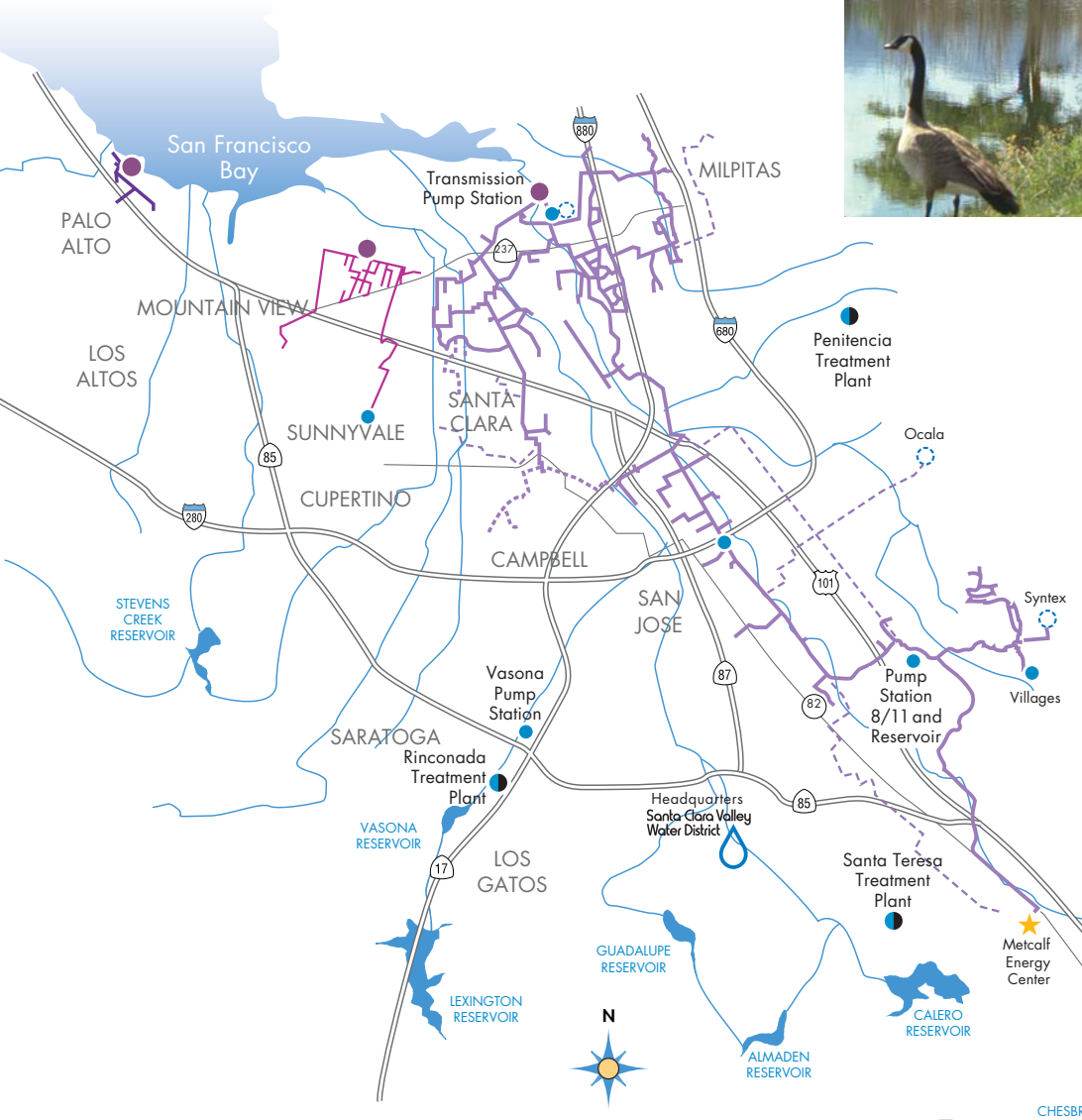
1997
- District increases recycled water subsidy to $115 per acre-foot.
- District begins subsidizing the City of Sunnyvale for recycled water delivered.
- Phase 1 of South Bay Water Recycling Program completed.

1999
- District and City of Gilroy partner to upgrade South County Recycled Water system.
- Recycled water use in Santa Clara County totals 2,357 acre-feet for FY 98-99.



Recycled Water in Santa Clara County





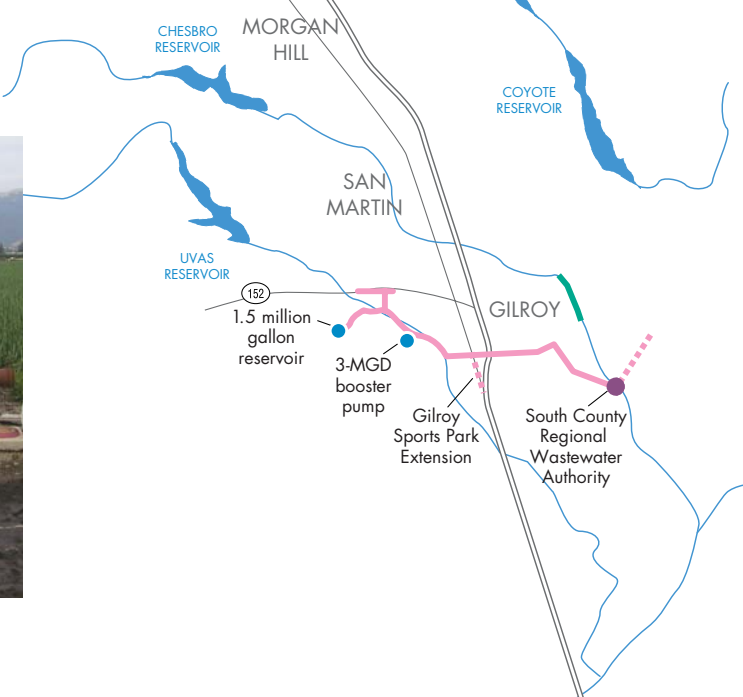
LEGEND

- SCVWD water treatment plant
- Recycled water treatment plant
- Existing pump stations and reservoirs
- Proposed reservoirs
- Proposed electrical power plant

Recycled Water Systems

EXISTING		PLANNED or PROPOSED
———	Palo Alto	
———	Sunnyvale	
———	SBWR	- - - - -
———	Llagas	
———	South County	▪▪▪▪▪





SOUTH COUNTY
Recycled Water

In 1977, the Santa Clara Valley Water District, the City of Gilroy and the Gavilan Water Conservation District (which was merged with the District in 1989) began a partnership to construct and operate a recycled water system extending from the South County Regional Wastewater Authority (SCRWA) treatment plant southeast of Gilroy to several customers along Hecker Pass Road. The system operated sporadically for about 20 years.

In 1999, the District, SCRWA and the City of Gilroy entered a partnership agreement to develop a marketable water recycling program in south county and provide for future expansions of the treatment plant and delivery system. Under this agreement, SCRWA serves as the supplier, the District is the wholesaler, and the City of Gilroy and the City of Morgan Hill are the retailers. Currently, the District takes delivery of the recycled water at the SCRWA treatment plant in southeast Gilroy and pumps it through a distribution system to a city park, a championship golf course in southwest Gilroy, and agricultural farmland. Last year the system delivered 619 acre-feet of recycled water to irrigators.



RECYCLING TIMELINE

2000

- Recycled water use in Santa Clara County totals 6,401 acre-feet for FY 99-00.

2001

- District begins Advanced Water Treatment Study (June, 2001).
- $82.5 million SBWRP Phase 2 expansion approved.
- Recycled water use in Santa Clara County totals 7,124 acre-feet in FY 00-01.

2002

- District and City of San Jose enter agreement on the SBWRP collaborative effort.
- Construction of new booster pump station, reservoir, and pipeline extension completed for South County Recycled Water system.

2003

- District and City of San Jose establish collaborative effort to expand recycled water use.



- Construction of the Silver Creek Pipeline extension begins.
- Recycled water use in Santa Clara County totals 8,368 acre-feet in FY 02-03.

2004

- Recycled water use in Santa Clara County totals 9,881 acre-feet in FY 03-04.
- Construction of the Silver Creek Pipeline completed in summer of 2004.

South County Recycled Water Projects

Upgrade of SCRWA system

The District's current agreement with the City of Gilroy and SCRWA includes an upgrade of the 25-year old system which delivers recycled water to south Gilroy. The SCRWA treatment plant has a peak production capacity of 3 MGD for recycled water to golf courses, parks and farmland along its eight-mile pipeline.

Last year the system delivered 619 acre-feet of recycled water to irrigators, thus freeing up the same amount of potable water for consumption.

System expansion

In summer 2002, the District started the operation of the booster pump station at Christmas Hill Ranch Park and the 1.5 million gallon concrete reservoir above Eagle Ridge Golf Club. In spring 2003, the District also completed the rehabilitation of the 25-year-old pipelines.



Cucumber field, sprinkler-irrigated with recycled water.

Recycled water supply to energy plant

The District and the City of Gilroy successfully negotiated with Calpine to use recycled water for its new energy plant's cooling towers. In 2003, Calpine completed a 1500-foot 12" pipeline in order to receive recycled water. This pipeline will be dedicated for the District.

South County Recycled Water Master Plan

The District and the City of Gilroy entered into a consultant service contract with Carollo Engineers to develop the South County Recycled Water Master Plan, which will identify short-term and long-term capital improvement projects for recycled water expansion.

The Master Plan is near completion. As the next step, the District is preparing to develop the Environmental Impact Report to ensure compliance with the California Environmental Quality Act (CEQA).



In 2003, the District constructed a permanent turnout to deliver recycled water to a local farmer.

PALO ALTO and SUNNYVALE
recycled water plans



Recycled Water Master Plan for Palo Alto

The District has been involved in the planning meetings with the Palo Alto Regional Water Quality Control Plant (RWQCP) and its stakeholders to help develop a long-term master plan for the future of recycled water in its service area. Once this plan is developed, the District will define its role in supporting Palo Alto RWQCP recycling goals, which include a possible system expansion and grant applications for feasibility studies to confirm potential uses, quantities, public acceptance and costs. The RWQCP serves Palo Alto, Mountain View, Los Altos, Los Altos Hills, Stanford University and the East Palo Alto Sanitary District.

The District is also working with the RWQCP and the City of Mountain View to expand recycled water use in redwood tree areas.



Recycled water provides dust control at construction sites using tanker trucks.

Support for Sunnyvale Water Pollution Control Plant

The City of Sunnyvale has significantly increased the recycled water delivery from 317 acre-feet in 2000 to 1,816 acre-feet in 2003, a 473% increase. This has included the recently connected customer, Twin Creeks—a large sports complex.

Meanwhile, the City has experienced a meaningful decrease in potable water consumption, primarily due to a combination of water recycling, water conservation and economic downturn.

The District has been providing a financial incentive to the City of Sunnyvale water recycling program since 1997 at the rate of $115 per acre-foot of recycled water used to offset potable water use. The reimbursement agreement that covered the period from 1997-2002 came to a close and the District signed a continuation agreement for another three-year period through June 2005. The reimbursement by the District helped the City to offset the deficit between revenues and expenses and enabled the City to invest additional capital improvements to increase system reliability and expand system capacity. The Sunnyvale WPCP is planning to expand its water recycling systems in order to meet state and federal discharge requirements.

Staff from the City and the District have had preliminary discussions on developing a long-term comprehensive operating strategy and on near-future recycled water expansion opportunities. The near term expansion could include improvements to the reliability of the system, and provide improved hydraulic stability by "looping" the system for greater versatility. Other possible future expansion could include serving recycled water to Moffett Field Golf Course and a proposed new development on NASA Ames. Serving these new customers may require a collaborative effort between the District, the City of Sunnyvale, the City of Mountain View, the City of Palo Alto and San Francisco Public Utilities Commission. However, this work will also require significant improvements to the distribution system. The looping of the system, as well as additional storage and pumping capacity, would be required to provide water in sufficient quantity and pressure to meet the demands of these customers within the limits of Mountain View.



The treated, or "reclaimed," wastewater irrigates the Municipal Golf Courses in Palo Alto and Mountain View.

DESALINATION
Bay Area Regional Desalination Project

The Bay Area's four largest water agencies, East Bay Municipal Utility District, the San Francisco Public Utilities Commission, Contra Costa Water District and the Santa Clara Valley Water District, are jointly exploring developing regional desalination facilities that could benefit 5.4 million Bay Area residents and businesses served by these agencies. The Bay Area Regional Desalination Project may consist of one or more desalination facilities, with an ultimate total capacity of up to 120 million gallons per day. The regional desalination project would:

- Provide additional sources of water during emergencies such as earthquakes;
- Provide a supplemental supply source during extended drought periods;
- Allow other major facilities such as treatment plants, transmission mains, and pump stations to be taken out of service for an extended period of time for maintenance or repairs; and
- Provide a full-time supplemental water supply to increase the diversity of the agencies' water supply portfolios, which would increase reliability.

In October 2003, the regional partner agencies jointly completed a Phase 1 Pre-Feasibility study that evaluated the construction of regional desalination facilities. Site selection for a desalination plant is one of the most important decisions in the development process as it may have a substantial impact on cost, schedule and potential environmental effects. Opportunities to locate near power plants and bay discharger sites were sought, since they offer potential power cost savings, brine dilution opportunities and other environmental benefits. The Phase 1 Pre-Feasibility Study concluded that there are at least three locations in the Bay Area where a regional desalination facility could be located without any fatal flaws. A systematic preliminary screening of potential Bay Area sites was completed. A two-step screening process helped narrow



Educational tour to Alameda County Water District's brackish desalination facility.

Proposed Desalination Sites



1 C&H Sugar Refinery Crocket
2 Mirant Contra Costa Plant Antioch
3 Mirant Pittsburg Plant Pittsburg
4 Palo Alto Water Pollution Control Plant Site
5 Pico Power Plant Site Santa Clara
6 Los Esteros Power Plant Site San Jose
7 Treasure Island Site San Francisco
8 Oceanside San Francisco
9 BDPL 1&2 at Dumbarton Point
10 Near Bay Bridge
11 Mallard Slough
12 San Francisco Airport
13 Barge-Mounted Plant

NOTE: Sites in bold were selected for further analysis.

the list of potential sites from over 20 to 13 and then to 3. The three sites that ranked the highest were:

- Mirant Pittsburg power plant site, Pittsburg
- Near Bay Bridge site, Oakland
- Oceanside site, San Francisco

Preliminary cost analysis indicated that siting a desalination plant at the Mirant Pittsburg Plant site would be the most cost effective, followed by Near Bay Bridge site and finally the Oceanside site.

Siting a regional desalination plant presents many regulatory and technical challenges. Cooperation of the four partner agencies in this effort will enhance the project's chances of success. Depending on the preferred facility locations and capacities, construction of additional pipelines and pump stations may be necessary. A Phase 2 Pre-Feasibility Study will be conducted to further analyze the three sites identified in the Phase 1 Pre-Feasibility Study, and to better define the desalination project facilities. The planned uses of the product water by each of the agencies, the institutional arrangements between the agencies, geotechnical and hazardous waste reconnaissance, preliminary environmental screening, and the conceptual engineering design of the treatment facilities will be performed during the second phase. The Phase 2 Pre-Feasibility Study is expected to take approximately six months to complete.

Next Steps

A detailed feasibility and environmental study will be conducted as the next step (estimated to cost approximately $4 million). State and federal funding will be sought to conduct the feasibility study. This level of study is needed to provide more information on potential benefits, location and type of facilities, appropriate technologies, environmental impacts, and to estimate costs of the various options. Public outreach will occur during this phase of the project.

After comprehensive technical, environmental, regulatory and cost information is available, a project description will be developed and the elected boards of participating agencies will make decisions about how to proceed with desalination facilities. If a specific project is selected, necessary inter-agency agreements would be developed to finance, design, build, and operate the facilities.



Pilot apparatus set-up at Alameda County Water District.



Tour of desalination pilot plant at Long Beach Water Department, Long Beach, California with District Board member Richard Santos (center).

Proposed Schedule and Projected Costs

- Phase 1 Pre-Feasibility Study, Completed (October 2003)
- Phase 2 Pre-Feasibility Study (December 2004)
- Detailed Feasibility and Environmental Study, 2 years (December 2006)
- Final Design and Construction, 3 years (December 2009)

The preliminary project cost for facilities to deliver 120 million gallons per day is estimated at $450 to $700 million, depending on the location and capacity of the facilities. Costs will be refined after completion of environmental review and the selection of preferred project locations and capacities. The cost share arrangements for the project will be based on the respective benefits received by the four agencies, as well as any other parties that may be identified as potential partners and beneficiaries.

Water Recycling Education and Outreach

Networking with cities and wastewater treatment plants
The District networks with area cities and wastewater treatment plants to ensure that the costs of future water supply and sewage treatment are balanced to provide the most efficient use of resources for the community. The District also provides staff support for its Water Retailers Recycling Subcommittee, Agricultural Water Advisory Committee and Landscape Advisory Committee. Staff members also track technical and regulatory developments that affect the production and use of recycled water, and participate in statewide recycling organizations and activities.

Water Recycling Cost Sharing Agreements and Grants

The WUE Unit participated in and finalized agreements and many different grant projects this year. These projects include:

- Water Softener Pilot Program: This DWR Prop.13 grant funded project began in FY 03-04, and will continue into FY 04-05, and offers a financial incentive for replacing old, inefficient water softeners $60,000
- Feasibility of Brackish Groundwater Reuse—DWR Grant through MWD $257,000
- Impact Evaluation of Stream Flow Augmentation with Tertiary Recycled Water—DWR Grant through MWD $300,000
- EPA II Desalination Research Grant through MWD $243,000
- California Energy Commission Grant through MWD (joint project with San Jose RO/EDR comparison) $50,000



A District technician conducting an inspection for the Water Softener Rebate Program.

Studies and Research: Water Recycling



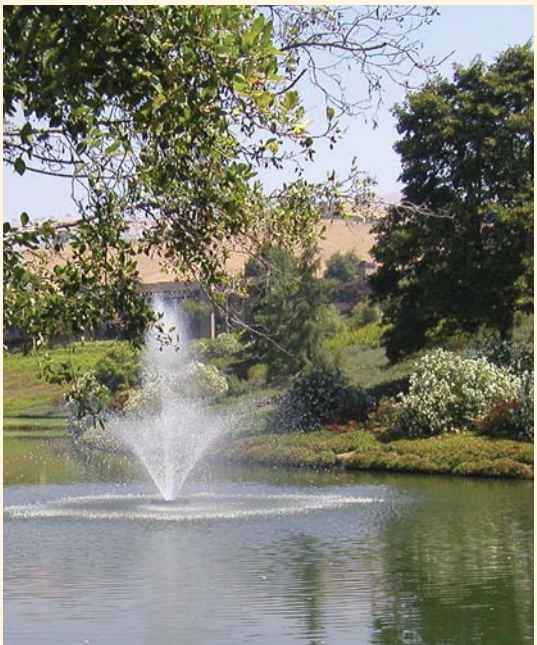
District governance policies call for the expansion of water recycling in Santa Clara County, while at the same time ensuring that groundwater basins are protected from threat of contamination.

To fulfill these goals, the District is working to identify new markets and uses for recycled water, while also conducting research to evaluate the effects that existing and planned recycled water projects may have on groundwater quality. While recycled water is currently used for large landscape irrigation, agriculture, and some industrial processes, it may also have uses for environmental purposes, such as enhancing stream flows, reservoirs and wetlands. Expanding recycled water applications will require increased monitoring of soil and groundwater quality parameters, as well as advanced levels of treatment depending on where and how recycled water is used.

Research will also investigate treatment methods to expand water recycling options and protect groundwater. Current research studies are described below.

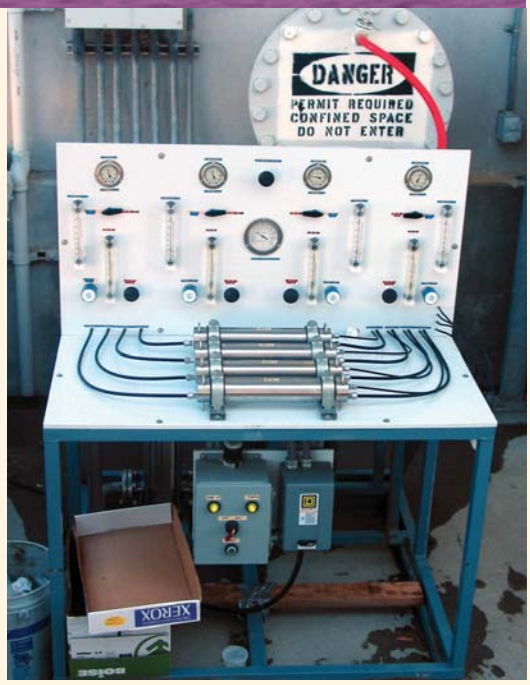
Advanced Recycled Water Treatment Feasibility Project

The District is currently conducting a feasibility study that will identify markets for advanced treated recycled water in industry, agriculture, large landscaping and environmental enhancement, including wetlands development and aquatic habitat maintenance. Recycled water from area recycled water treatment plants was sampled and analyzed for a wide range of constituents to assess its applicability to various markets. The study will examine the different uses of advanced treated recycled water and identify feasible water quality standards that protect the county's groundwater and environmental resources.



The study is being conducted with participation from environmental groups, water retailers and local agencies, as well as representatives from homeowner associations and the business/industrial and agricultural communities. Results from this study will help develop viable advanced treatment pilot/demonstration or full-sized plants which will serve to expand the use of recycled water in this county. (Timeline: January 2002 to August 2004)

Characterization of Salinity Contributions in Sewer Collection and Reclaimed Water Systems
The District is participating in this nationwide study which will determine the amounts of salt contributed to reclaimed water systems by different sectors, specifically residential users, restaurants, and industrial/commercial operations. The District is funding this cooperative study along with participating agencies nationwide. This study will result in best management practices to control salinity coming into a wastewater treatment plant. (Timeline: May 2002 to February 2004)



RP Bench scale setup.

Desalination Pilot Advanced Treatment Project: Electrodialysis Reversal/ Reverse Osmosis (EDR/RO) Comparison Pilot Study
The District has developed agreements with the City of San Jose and Metropolitan Water District of Southern California to support (via a California Energy Commission grant) and participate in this study to investigate the desalination capabilities of reverse osmosis and electrodialysis equipment, focusing on the removal of dissolved solids from recycled water. The study will demonstrate the technical feasibility of advanced water treatment as well as provide detailed cost data useful in planning for larger treatment works. (Timeline: April 2003 to December 2004)

Research Studies:
(1) The Feasibility of Brackish Groundwater Reuse and
(2) Impact Evaluation of Streamflow Augmentation with Tertiary Recycled Water
In FY 03-04, the District and its research partner, Stanford University, embarked on two grant-financed research studies entitled "The Feasibility of Brackish Groundwater Reuse" and "Impact Evaluation of Streamflow Augmentation with Tertiary Recycled Water." These two grant projects have secured state grants from the California Department of Water Resources through the Desalination Research and Innovation Partnership (DRIP) administered by the Metropolitan Water District of Southern California.


District staff and research partners from Stanford University discuss the Coyote Creek Stream Flow Augmentation Program.

(1) THE FEASIBILITY OF BRACKISH GROUNDWATER REUSE

The research project "The Feasibility of Brackish Groundwater Reuse" will investigate the feasibility of implementing brackish groundwater reuse alternatives in Santa Clara County to supplement expected shortages in future supplies of potable water. This project will have the potential to identify a new source of supply. The project will demonstrate the technical and economic feasibility of treating brackish groundwater with state of the art technology to a suitable quality for beneficial uses. (Timeline: December 2003 to December 2006)



District graduate intern sampling recycled water for laboratory analysis.

(2) IMPACT EVALUATION OF STREAM FLOW AUGMENTATION WITH TERTIARY RECYCLED WATER

The District currently has mandates to release water from its reservoirs to provide live-creek flows in certain creeks within this county. "Impact Evaluation of Stream Flow Augmentation with Tertiary Recycled Water" will investigate if treated recycled water can be successfully used to augment streams. Limited research studies elsewhere determined that treated recycled water released into a creek undergoes attenuation of chemicals of concern. In this project, for a pilot period of approximately four months, tertiary treated recycled water will be released in a creek to determine streamflow and streambed attenuation of chemicals of concern. This study will investigate the effects of local conditions in determining what is filtered by streambed action and natural percolation, and whether there will be groundwater or other impacts. If quality is impacted, the study will research the type of advanced water treatment necessary. The project will ensure the protection of upper and lower aquifers in the groundwater basin and stream water quality, while piloting the use of recycled water for stream flow augmentation. (Timeline: December 2003 to June 2007)

n-Nitrosodimethylamine (NDMA) Fate and Transport

NDMA is a carcinogen sometimes found in recycled water. The District is participating in a statewide study conducted by a leading research team led by Dr. David Sedlack of University of California, Berkeley. The primary objectives of this project are to understand the fate and transport of NDMA in soil and groundwater when recycled water is used for spray irrigation and indirect and/or direct groundwater recharge. This will be accomplished by documenting and assessing any current fate and transport data, and through field and laboratory experiments. One local site in Santa Clara County is part of this study. (Timeline: February 2003 to May 2005)



The proposed research project will employ a combination of laboratory and field studies to address the attenuation of NDMA, and to identify the mechanisms responsible for that attenuation. Laboratory experiments will be conducted to quantify physical removal (e.g., volatilization from soil after landscape irrigation), chemical transformation (e.g., transformation in surface water conveyance systems, and in ponds used for irrigation storage and spreading basins used for groundwater recharge) and biotransformation (e.g., metabolism by soil bacteria). Predictions from laboratory experiments will be tested by comparison with soil column studies and data collected at field sites where water reuse is practiced. Results from the laboratory experiments, column studies, test plot studies and field measurements will be integrated into a final report to present the study results. While one desired outcome of the study is to provide practitioners of water reuse with recommendations of practices to minimize the potential for contamination of groundwater with NDMA, depending on the project's overall budget and funding commitments, this work will likely be funded in subsequent phases of the project. (Timeline: April 2003 to March 2005)

Groundwater Monitoring

The District continually monitors groundwater quality and is expanding its monitoring network to target areas where recycled water is used for irrigation. The monitoring data will be used to detect and correct potential problems early on, before they have a chance to develop. (Timeline: ongoing)

Pilot Water Softener Rebate Program Study

This pilot study is designed to help the District assess the types of outreach programs and incentive offers required to encourage customers to use more efficient water softening technology, and thereby reduce harmful salt concentrations in wastewater and conserve potable water. The District obtains partial funding for the project from the California Department of Water Resources. (Approximate timeline: November 2003 to May 2005)



District technician conducting an inspection for the Water Softener Rebate Program.